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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER	
WASSUM, LUKE S	

ART UNIT	PAPER NUMBER
2177	19

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/435,034	NISHIZAWA ET AL.	
	Examiner	Art Unit	
	Luke S. Wassum	2177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *35-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Applicants' amendment, filed 13 May 2004 has been received, entered into the record, and considered.

2. As a result of the amendment, claims 35 and 36 have been amended. Claims 1-35 have been previously canceled. Claims 35-37 remain pending.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

The Invention

4. The claims are drawn to a data warehouse system whereby partial replicas can be created in response to a user query in order to improve query response. In the art of data processing, this technique is known as dynamic data replication.

Drawings

5. The drawings originally submitted with this application on 25 May 2000 contain deficiencies that were noted on form PTO-948, which was mailed to the Applicants as part of paper number 7 on 19 March 2002. In addition, the Applicants submitted a formal drawing change to Figures 10(a) and 10(b) on 19 September 2002 which includes handdrawn corrections.

6. While these drawings are acceptable for examination purposes, the examiner encourages the Applicant to submit formal drawings correcting these deficiencies at the earliest opportunity. Early submission of formal drawings will help expedite post-allowance processing and publication of the issued patent.

Claim Objections

7. Claim 36 is objected to because of the following informalities:

In the last line of the 'query analysis unit' limitation, the word 'from' is misspelled 'form'.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham* v. *John Deere Co*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Rabinovich** (U.S. Patent 6,256,675) in view of **Olson et al.** (U.S. Patent 5,995,980) in view of **Hammond** (U.S. Patent 5,758,337).

12. Regarding claim 35, **Rabinovich** teaches a data warehouse system as claimed, comprising:

a) a plurality of client devices, each for accepting a processing request from each user thereof (see Requester 109 in Figure 1; see also col. 4, lines 41-65);

b) a server provided with a database and used for searching said database according to access requests from said client devices (see hosts 103, 104 and 105 in Figure 1, each of which are analogous to the claimed server; see also col. 4, lines 45-50 and col. 4, line 66 through col. 5, line 2; see also root replica, in Figure 11 and also at col. 13, lines 44-52);

c) at least one data collector, separate from said server and associated with at least one of said client devices and each being provided with a storage device, each for collecting data requested by a corresponding user and storing the data into said storage device as a replica partially replicating said database (see discussion of the replica placement decision making process, col. 8, line 32 through col. 9, line 23; see also disclosure that there is one 'replicator', analogous to the request distributor, at each internal area, in each internal autonomous system, and at each host, col. 13, lines 44-52);

d) a network for connecting said client devices to said server respectively via data collector (see network 102 in Figure 1);

wherein each of said data collectors comprises:

i) a replica creation control means for determining whether a new replica of said database is to be created and stored in said storage device, in response to a replica creation request from a corresponding client device (see discussion of the replica placement decision making process, col. 8, line 32 through col. 9, line 23);

ii) a query analysis unit for analyzing a query processing request from one of said client devices to select, as an object to be searched, a replica stored in said storage device (see discussion of Request Distributor, col. 4, lines 40-65, et seq.);

iii) a query processing unit for searching said replica stored in said storage device according to a query analysis result from said query analysis unit (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of determination of metrics in selecting a host to which the request is to be forwarded, lines 45-59); and

iv) a communication control unit for selecting a procedure for accessing said server according to analysis result (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of forwarding a request to a selected host, lines 55-61); and

wherein said server comprises:

i) a communication control unit for receiving a query analysis result transmitted from said data collector (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of the selected host sending a response to the requester, lines 59-61); and

ii) a query processing unit for searching the database of said server (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of the selected host sending a response to the requester, lines 59-61).

Rabinovich does not explicitly teach an implementation of the data warehouse system where the objects correspond to databases.

Olson et al., however, teaches a data warehouse system where the objects correspond to databases, including:

a) at least one client device (see col. 5, lines 61-67; see also User Clients 24_1, 24_{n-1} and 24_n in Figure 1);

b) at least one server (see col. 5, lines 55-60; see also Central Computer 11 in Figure 1);

c) at least one data collector for collecting data requested by the user (see col. 6, lines 28-56; see also Figure 2; see also col. 8, lines 25-67);

d) a database for storing data collected by the data collector (see col. 5, lines 61-67; see also databases 22_1, 22_{n-1} and 22_n in Figure 1);

e) a network (see col. 3, lines 50-52); and

wherein each replica is managed so that a replica can be shared among cooperative data collectors when processing said query which corresponds the content of said created replica to information related to the location of said replica stored in said database (see col. 1, lines 21-24; see also col. 3, lines 34-36; see also col. 7, line 19 through col. 8, line 25; see also Figure 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the replica management and query distribution functions as taught by **Rabinovich** to a partially replicated database system such as that taught by **Olson et al.**, since replicated databases reduce contention for access to a primary database, as well as providing a backup in the event of media failure (see col. 1, lines 17-26).

Neither **Rabinovich** nor **Olson et al.** explicitly teaches a system wherein definitions of the partial replicas are stored in a table.

Hammond, however, teaches a system wherein definitions of the partial replicas are stored in a table (see Figure 8; see also col. 6, line 24 through col. 7, line 60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a table to define the partial replicas, since storing information defining each partial

replica in a table allows the system to manage the creation and synchronization of data between the master database and the partial replicas (see col. 6, lines 24-65).

13. Regarding claim 36, **Rabinovich** teaches a data warehouse system as claimed, comprising:

a) a plurality of client devices, each for accepting a processing request from each user thereof (see Requester 109 in Figure 1; see also col. 4, lines 41-65);

b) a server provided with a database and used for searching said database according to access requests from said client devices (see hosts 103, 104 and 105 in Figure 1, each of which are analogous to the claimed server; see also col. 4, lines 45-50 and col. 4, line 66 through col. 5, line 2; see also root replica, in Figure 11 and also at col. 13, lines 44-52);

c) a plurality of data collectors, separate from said server and associated with at least one of said client devices and each being provided with a storage device, each for collecting data requested by a corresponding user and storing the data into said storage device as a replica partially replicating said database (see discussion of the replica placement decision making process, col. 8, line 32 through col. 9, line 23; see also disclosure that there is one 'replicator', analogous to the request distributor, at each internal area, in each internal autonomous system, and at each host, col. 13, lines 44-52);

d) a network for connecting said client devices to said server respectively via data collector (see network 102 in Figure 1);

wherein each of said data collectors comprises:

i) a replica creation control means for determining whether a new replica of said database is to be created and stored in said storage device, in response to a

replica creation request from a corresponding client device (see discussion of the replica placement decision making process, col. 8, line 32 through col. 9, line 23);

ii) a query analysis unit for analyzing a query processing request from one of said client devices to select, as an object to be searched, a replica stored in said storage device according to a query analysis result from said query analysis unit (see discussion of Request Distributor, col. 4, lines 40-65, et seq.);

iii) a query processing unit for searching said replica stored in said storage device according to a query analysis result from said query analysis unit (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of determination of metrics in selecting a host to which the request is to be forwarded, lines 45-59); and

iv) a communication control unit for selecting a procedure for accessing said server according to analysis result (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of forwarding a request to a selected host, lines 55-61); and

wherein said server comprises:

i) a communication control unit for receiving a query analysis result transmitted from said data collector (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of the selected host sending a response to the requester, lines 59-61); and

ii) a query processing unit for searching the database of said server (see discussion of Request Distributor, col. 4, lines 40-65 et seq., and particularly the disclosure of the selected host sending a response to the requester, lines 59-61).

Rabinovich does not explicitly teach an implementation of the data warehouse system where the objects correspond to databases.

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a) at least one client device (see col. 5, lines 61-67; see also User Clients 24_1, 24_{n-1} and 24_n in Figure 1);

b) at least one server (see col. 5, lines 55-60; see also Central Computer 11 in Figure 1);

c) at least one data collector for collecting data requested by the user (see col. 6, lines 28-56; see also Figure 2; see also col. 8, lines 25-67);

d) a database for storing data collected by the data collector (see col. 5, lines 61-67; see also databases 22_1, 22_{n-1} and 22_n in Figure 1);

e) a network (see col. 3, lines 50-52); and

wherein each replica is managed so that a replica can be shared among cooperative data collectors when processing said query which corresponds the content of said created replica to information related to the location of said replica stored in said database (see col. 1, lines 21-24; see also col. 3, lines 34-36; see also col. 7, line 19 through col. 8, line 25; see also Figure 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the replica management and query distribution functions as taught by **Rabinovich** to a partially replicated database system such as that taught by **Olson et al.**, since replicated databases

reduce contention for access to a primary database, as well as providing a backup in the event of media failure (see col. 1, lines 17-26).

Neither **Rabinovich** nor **Olson et al.** explicitly teaches a system wherein definitions of the partial replicas are stored in a table.

Hammond, however, teaches a system wherein definitions of the partial replicas are stored in a table (see Figure 8; see also col. 6, line 24 through col. 7, line 60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a table to define the partial replicas, since storing information defining each partial replica in a table allows the system to manage the creation and synchronization of data between the master database and the partial replicas (see col. 6, lines 24-65).

14. Regarding claim 37, **Hammond** additionally teaches a data warehouse system wherein said replica management table further holds additional replica descriptions including a data range and a location of each replica stored in storage device of cooperative data collectors (see Figure 8; see also col. 6, line 24 through col. 7, line 60), and **Olsen et al.** teaches a data updating interval of a replica (see col. 1, line 27 through col. 2, line 11, and particularly col. 1, lines 47-51), the determination of whether or not to create a new replica having been taught by **Rabinovich** (see discussion of the replica placement decision making process, col. 8, line 32 through col. 9, line 23).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a table to define the partial replicas including data range, data updating interval and replica location, since storing information defining each partial replica in a table allows the system to manage the creation and synchronization of data between the master database and the partial replicas, as well as decisions as to a replica from which data can be most efficiently retrieved (see **Hammond**, col. 6, lines 24-65).

Response to Arguments

15. Applicant's arguments with respect to claims 35-37 have been considered but are not persuasive.

16. Regarding the Applicants' assertion that claim 36 has been amended to rectify the pending claim objection, the examiner respectfully responds that the cited deficiency still remains in the claim.

17. Regarding the Applicants' argument that none of the references teach the data collector located remote from said server, the examiner respectfully disagrees.

The **Rabinovich** reference teaches a system wherein there exist a number of hosts, all storing what are termed 'replicas'. The replicas are data sources from which data is requested by the requestor (109 in Figure 1). In fact, any of the hosts (103-105 in Figure 1) can serve the role of the claimed server, depending upon where a particular data item resides.

The request distributor (101 in Figure 1), also called a 'replicator' (see col. 13, lines 47-48) plays many roles; it determines which host would most efficiently satisfy a request for data (analogous to the claimed query analysis unit), makes decisions on when a new replica should be created (analogous to the claimed replica creation control), and also carries out the replica creation process (analogous to the claimed data collector).

Furthermore, **Rabinovich** teaches that there are 'replicators' for each host, and that when a host decides to place a replica in another area, it sends a request to the replicator that manages that area/host. Thus, for the purposes of the Applicants' claims, the replicator (analogous to the claimed data collector) resides separate from the host (analogous to the claimed server) from which it is replicating data. The replicator stores the replica on the host which it manages. See col. 13, line 44 through col. 14, line 6).

Thus, the examiner believes that the architecture of the **Rabinovich** reference anticipates the claimed system wherein the claimed data collector (embodied in a request distributor, or replicator, managing a host) collects data from the claimed server (embodied in a different host) and stores it as a partial replica of the data residing on the server.

The finality of this rejection is withheld by the examiner in order to make the grounds of rejection more explicit to the Applicants.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke S. Wassum whose telephone number is 703-305-5706. The examiner can normally be reached on Monday-Friday 8:30-5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

In addition, INFORMAL or DRAFT communications may be faxed directly to the examiner at 703-746-5658.

Customer Service for Tech Center 2100 can be reached during regular business hours at (703) 306-5631, or fax (703) 746-7240.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luke S. Wassum
Art Unit 2177

lsw
9 June 2004